

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 23 MAR 2006

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Applicant's or agent's file reference EXPL/205001854/KC/EK/kt	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/SG2003/000274	International filing date (day/month/year) 20 November 2003	Priority date (day/month/year) 20 November 2003	

International Patent Classification (IPC) or national classification and IPC

Int. Cl.

C12N 15/11 (2006.01)

C12N.15/01 (2006.01)

Applicant

AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH et al

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☐ (sent to the applicant and to the International Bureau) a total of sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Box No. I | Basis of the report |
| <input type="checkbox"/> Box No. II | Priority |
| <input type="checkbox"/> Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI | Certain documents cited |
| <input checked="" type="checkbox"/> Box No. VII | Certain defects in the international application |
| <input checked="" type="checkbox"/> Box No. VIII | Certain observations on the international application |

Date of submission of the demand

10 June 2005

Date of completion of this report

7 March 2006

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/SG2003/000274

Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☒ The international application in the language in which it was filed
- ☐ A translation of the international application into _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3(a) and 23.1 (b))
- ☐ publication of the international application (under Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☐ the international application as originally filed/furnished
- ☒ the description:

pages 1-38 as originally filed/furnished

pages* received by this Authority on _____ with the letter of

pages* received by this Authority on _____ with the letter of

☒ the claims:

pages 39-41, 43 as originally filed/furnished

pages* as amended (together with any statement) under Article 19

pages* 42 received by this Authority on 20 February 2006 with the letter of 20 February 2006

pages* received by this Authority on _____ with the letter of

☒ the drawings:

pages 45, 46 as originally filed/furnished

pages* received by this Authority on _____ with the letter of

pages* received by this Authority on _____ with the letter of

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to the sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to the sequence listing (*specify*):

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-34	YES
	Claims	NO
Inventive step (IS)	Claims 1-30, 34	YES
	Claims 31-33	NO
Industrial applicability (IA)	Claims 1-34	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

The following documents identified in the International Search Report have been considered for the purposes of this report:

- D1 Branda, R. F., et al; MUTATION RESEARCH, (1999 Jun 30) 427 (2) 79-87.
D2 Szala, S., and Chorazy, M; BULLETIN DE L'ACADEMIE POLONAISE DES SCIENCES, SERIE DES SCIENCES BIOLOGIQUES (1969),17(5),277-84
D3 Zacharias, M., and Sklenar, H.; BIOPHYSICAL JOURNAL, (2000), Vol 78: 2528-2542
D4 Fox, K. R., et al; NUCLEIC ACIDS RESEARCH, (2000), Vol 28 (13): 2535-2540.

Novelty (N) and Inventive Step (IS)

The invention lies in a method of enriching the GC content of a DNA molecule, which results in a functional alternative to the natural evolution process. GC enrichment is done by providing a DNA molecule in which some of the A residues pair with U residues and then replicating the DNA so as to replace the U residues with G residues, thereby increasing the GC content of the DNA molecule. The method is also used as means of making mutant polypeptides. None of the prior art documents searched disclose such a method for GC enrichment or for making mutations. The subject matter of claims 25-30 as submitted on 20 February 2006 are drawn to mutants prepared by the disclosed method and as such, the invention claimed in claims 1-34 appears to be both novel and inventive in light of D1-D4.

Claims 31-33 do not involve an inventive step because they are construed as defining a kit of known parts namely dUTP and an agent, such as glycerol, which is capable of increasing the polarity of a replication reaction medium. While it is appreciated that as indicated in the letter of 20 February 2006, such kits are novel and the skilled person would be able to arrive at such an invention, it is considered that the kits are not inventive. Both components included in the kit are well known in the art, and putting together known integers to make a kit, does not involve an inventive step, as distinct from a kit of known components 'when used for' GC enrichment of a DNA molecule.

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

The numbering of the drawings pages does not comply with PCT Rule 11.7, Section 207(b).

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

In claims 31-33 the use of the term "for" does not restrict the claims to a specific use, it simply defines a kit comprising independent known integers capable of use in GC enrichment of a DNA molecule. Therefore in the absence of limitation of the claims to a kit "when used for" GC enrichment of a DNA molecule claims are not fully supported by the specification.